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ABSTRACT

The purpose of the study of two sets of infant twins, where one infant of each set was severely handicapped, was to investigate the effect of a handicapping condition on mother-infant interactions and to investigate the conditions under which coordinated attention to an object and a person is demonstrated. This study provided a unique opportunity to make across-mother and within-mother comparisons of mother-infant interactions with fraternal twins. Microanalysis of several aspects of mother-infant free-play sessions showed that handicapped infants emitted fewer object-directed behaviors, had fewer instances in which their leads were followed, and spent relatively little time in joint attention with mother. The data also suggested that repetitive sequences with an object may be an important context in which coordinated attention is demonstrated. (Author/CL)

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Mother-Infant Engagements in Dyads with Handicapped and Nonhandicapped Infants: A Pilot Study

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Abstract

The purpose of this study was a) to investigate the effect of a handicapping condition on mother-infant interactions and b) to investigate the conditions under which coordinated attention to an object and a person is demonstrated. This study provides a unique opportunity to make across-mother and within-mother comparisons of mother-infant interactions in two sets of fraternal twins. In each set, one infant was handicapped while the other was nonhandicapped. Microanalysis of several aspects of mother-infant free-play sessions showed that handicapped infants emitted fewer object-directed behaviors, had fewer instances in which their leads were followed, and spent relatively little time in joint attention with mother. The data also suggest that repetitive sequences with an object may be an important context in which coordinated attention is demonstrated.

Mother-Infant Engagements in Dyads with Handicapped and Nonhandicapped Infants: A Pilot Study

Mother-infant engagements have been of recent interest, in part, because of their hypothesized relationship to later child development. For example, mother-infant engagements are the context in which prelinguistic communicative behaviors are first observed. Several researchers have looked at prelinguistic communication as the onset of a continuum of communicative behaviors that eventually may develop into language (Harding, 1983; Clark, 1978; Bruner, 1982).

Within these prelinguistic engagements, mothers and infants both influence each other's behavior (Bell, 1974). A handicapped infant may produce behaviors, or fail to produce important behaviors, which greatly change the form of mother-infant engagements. For example, mothers may find it difficult to maintain an interaction in the face of frequent infant regulatory behaviors, e.g., gaze aversions, crying, or active reflex patterns (Als, 1982). This study is focused on how mothers and infants regulate and influence each other's behavior with respect to initiating, terminating and maintaining their interactive episodes. These episodes are sequences of behavior in which mother and infant attend to the same objects for a sustained period. Within an episode, objects often provide a focus around which mothers and infants can interact (Schaffer, 1977). Episodes of interaction frequently occur without objects (e.g., peek-a-boo). In this study, we are most interested in episodes which did involve objects.

Since these kinds of episodes often involve sustained pairing of stimulation between mother and an object, they may provide an important

context in which the infant learns to coordinate his attention to objects and mother. There is evidence to suggest that, during the early part of the first year of life, the infant does not attend to objects and people simultaneously (Clark, 1978; Gray, 1978; Nelson, 1979; Trevarthen and Hubley, 1978). The development of coordinated attention between objects and people may be important for at least three reasons: a) attention to both an object and to the person to whom the communication is directed may provide the basis on which some early prelinguistic communicative functions are built; b) coordination of the object and the social worlds may become important in subsequent production of the full range of linguistic communicative functions; and c) mothers may eventually require the infant's coordinated attention to mother and an object before they are willing to interpret their babies' behavior as communicative.

Coordinated attention to objects and people may provide the basis for the prelinguistic communicative functions of requesting and showing. Acts which show a person an object or ask a person for an object are more successful at achieving their goal if they either get the attention of the person to whom communication is directed or direct that person's attention to the object of interest (Gray, 1978). Harding (1983) suggests that mothers most often interpret their babies' behavior as communicative if their babies make eye-contact with them while vocalizing or gesturing toward an object. Thus, coordinated attention to objects and people increases the probability that the infant will get a mother to look at and/or retrieve an object.

Nelson (1979) suggests that prelinguistic coordination of the social and object worlds is essential to language development. She presents

data to show that children who learn to talk before such coordination takes place tend to use their language for predominantly social purposes (i.e., expressive children) or predominantly referential purposes (i.e., referential children). She proposes that only after coordination of the object and social worlds do these children use their language to specify both the referent and the social context. Children who learn to talk late often use their language for both referential and social purposes. This may be because they learn to talk after prelinguistic coordination of the object and social worlds.

Finally, mothers may eventually require evidence of coordinated attention before they interpret their babies' behaviors as communicative. Harding (1983) found that only 6 of 12 mothers reported that they interpreted their babies' random movements as communicative. Additionally, none of these mothers were found to respond to these random movements as if they were communicative. However, Harding found that 9 out of 12 mothers did respond to their babies' behavior as if it were communicative if the behavior involved eye-contact with the mother. Therefore, mothers may need evidence that the infant is directing his attention to the mother before she will interpret and respond to his behaviors as communicative.

In summary, the literature suggests that coordinated attention is important for later communicative development. Sustained interactive episodes which involve joint attention to an object may be an important context in which infants learn and demonstrate coordinated attention. The presence of a handicapping condition may greatly affect the form and length of these episodes. The purpose of this study was twofold: 1) to

investigate the mutual influence of the mother's and infant's behavior in establishing and maintaining these episodes and 2) to explore a possible context in which infant coordinated attention to an object and to mother is demonstrated and developed.

This study provides a unique opportunity to study how the presence of a handicapping condition affects the mother's behavior and the form of the resulting interaction. Most studies which compare mother-infant engagement in dyads with handicapped and nonhandicapped infants have used some type of matching procedure to attempt to control for confounding variables (e.g., Jones, 1977). Unfortunately, such matching procedures do not control for differences between mothers. The subjects for this study are two sets of fraternal twins and their mothers. The male in each set is severely handicapped, whereas the female in each set is developing normally. These subjects allow us to observe the same mother interacting with a handicapped child and a nonhandicapped child. The second set of twins allows a replication to determine the effects of the handicapping condition on the interaction that may be common to both sets of twins.

Method

Subjects

Both sets of twins were recruited from an early intervention program in effect across the state of North Carolina, as a part of a larger longitudinal study of the development of exceptional children. Each handicapped twin was being served by the home-based early intervention program. Both twins' handicapping condition was brought about by a severe trauma. One twin suffered anoxia of a prolonged nature during

birth, resulting in brain damage and recurrent seizures. The other twin suffered meningitis at 6 months of age. The extent of damage is undetermined, but he too suffers seizures, and visual and auditory capacities are uncertain. In both cases the nonhandicapped twin is a female and developing normally.

Procedure

When the infants were 12 months old, each mother and her twins came to the Frank Porter Graham Research Center in Chapel Hill. While at the center, demographic information was collected from the mothers about the families. The child was given the Bayley Scales of Infant Development and the Movement Assessment of Infants (MAI) (Chandler, Andrews, & Swanson, 1980). The latter instrument assesses the quality of movement, not developmental motor milestones. An overall risk score is obtained by summing across four subscales; the higher the score, the greater the risk in motor development.

Also during a visit to the Center the mother and each of her twins were videotaped for 20 minutes playing together. The setting for the observation sessions was a carpeted area of a lab. In the area were large pillows, a mat, several developmentally appropriate toys and a few magazines.

The parents were told that we are interested in how babies played with toys and their mothers and to interact with their babies as they would if there were at home. The 20 minute session was then videotaped for later analysis.

The last five minutes of each session were independently coded by two observers. The last segment of the session was chosen to allow the

infant and mother to have become well engaged in interaction before coding was begun. Any disagreement between the observers was resolved through repeated viewings until the observers could arrive at 100% consensus.

The following behaviors were coded from videotapes.

Coordinated attention to an object and a listener is implicit in requesting and showing objects, two of the earliest and most frequently observed prelinguistic communicative functions (Bates, Camaioni, Volterra, 1979). Examples of behaviors judged to be coordinated attention were 1) alternation of gaze between an object and the mother's eyes, 2) handing an object to mother, and 3) some action which involved an object being directed toward the mother, e.g., throwing an object to mother. Of the three behavior classes, only alternating gaze between mother and an object was expected to be seen in the handicapped infants.

Also implicit in many early communicative behaviors is joint attention to an object. "Joint attention" was coded when both partners acted on, touched, or gazed toward the same object or when the infant or mother attended to the other partner who was in turn attending to the object.

When joint attention is sustained over 10 seconds, the sequence was called an episode. In addition to lasting at least 10 seconds, these episodes must also have at least two alternating turns from each partner which showed joint attention to an object. An example of an episode is when mother shows a rattle to the baby. The baby looks at the rattle. Mother gives it to the baby. And the baby shakes the rattle.

One type of episode that may be important to the demonstration of coordinated attention is that of a repetitive game-like sequence. These episodes involved at least 2 cycles of repeated action with an object which was contingent on the baby's behavior. For example, mother covers up a toy bug with a scarf, baby uncovers the bug, then mother covers up the bug again and the cycle repeats.

Mother may increase the probability that an episode will be established by following the child's lead. "Following the child's lead" refers to shifting attention to the same object to which the baby has shifted his attention. For example, mother and baby have been looking at a ball; the baby shifts his gaze to the rattle; mother begins playing with the rattle.

Results and Discussions

The data reported here are a portion of the total body of data collected for the study. Each set of twins was 12 months old. Table 1 shows the cognitive and motor status of the infants. Note that within each twin pair the infants were on quite different developmental levels. However, the handicapped infants appeared to be on approximately the same developmental level. The nonhandicapped children's cognitive and motor scores were also similar.

Place Table 1 about here

The mothers however were from different socioeconomic levels. Table 2 details their respective educational levels, race, and income levels.

Place Table 2 about here

The present data are organized by the similarities and differences in the demands the two set of twins made on the mothers and the resulting interactions, in an effort to discover 1) the effects of a handicapping condition on mother-infant interaction and 2) a context in which coordinated attention is demonstrated.

Table 3 details data which indicate that the handicapping condition affected the interaction in both sets of twins in similar ways.

Place Table 3 about here

In both twin pairs, the atypical infant usually interrupted joint attention with a behavior that did not focus on a new stimulus. Table 3 shows that the atypical infants interrupted joint attention to an object with the activation of a reflex pattern 45% and 65% of the time. The second most frequently observed behavior which interrupted joint attention was unfocused gaze (36% and 10%). The least frequent infant interruptions were those which focused on a new object (0 and 15%). Thus, both atypical infants engaged in behaviors (involuntarily) which made sustained attention to an object with their mothers very difficult.

Finally, the atypical children spent less total time in episodes than did the nonhandicapped children. As can be seen in Table 3, nonhandicapped infants A and B spent 135 and 202 seconds of the total 300 second segment in sustained joint attention episodes. The atypical infants A and B spent only 14 and 84 seconds respectively in episodes. The atypical babies' frequent nondirected behaviors provided fewer opportunities for the mother to establish joint attention by following the child's lead. This may have resulted in fewer opportunities for establishing an episode.

In contrast, the nonhandicapped infants in both twin pairs usually used object directed behaviors when they interrupted joint attention. That is, the nonhandicapped infants interrupted joint attention to an object most often to attend or play with a new object of interest. Table 3 shows that nonhandicapped infants A and B interrupted joint attention with object-directed behaviors 53% and 67% of the time respectively. This kind of redirection of interest is obviously easier for mothers to follow and understand.

In both sets of twins, the mother followed the nonhandicapped child's lead more than she followed the atypical child's lead. In Table 3 the reader can see that mothers A and B followed the nonhandicapped infants' leads seven and six times respectively, whereas the mothers followed the atypical infants' leads only one and two times respectively. The nonhandicapped children gave their mothers behaviors which she could more easily follow and expand on.

To summarize, the interactions of both twin sets showed at least three common effects of the handicapping condition on mother-infant interaction: a) the handicapped infants interrupted joint attention with nondirected behaviors; b) the mother followed the handicapped infant's leads fewer times; and c) the handicapped infants spent less time in sustained joint attention episodes.

Table 4 details the data which demonstrate the ways the interactions of twin pair A differed from those of twin pair B. These differences help to identify a context in which coordinated attention may be developed and demonstrated and they indicate individual variability in mothers' interactive patterns with their infants, typical as well as atypical in development.

Place Table 4 about here

Neither child in twin pair A directed an act to mother, while the children in twin pair B did so frequently. Table 4 shows that the atypical and typical infants from twin set B emitted 15 and 26 mother-directed behaviors respectively, whereas neither child in twin set A emitted any mother-directed behaviors during the 5 minute segment.

Neither child in twin pair A showed coordinated attention to mother and an object. Again both of the children in pair B did show instances of coordinated attention. The nonhandicapped infant B showed 25 instances of coordinated attention, and handicapped infant B showed 3 instances of coordinated attention.

These results were unexpected. We predicted that coordinated attention would be demonstrated with increasing developmental capability. However, as seen in Table 4, this was not the case. Why would neither child in twin set A demonstrate coordinated attention?

One explanation is differences in the atypical infants. Twin B began life handicapped because of severe birth trauma. In contrast, twin A began life as normal and later suffered severe trauma with spinal meningitis. The resulting brain damage may prevent coordinated attention from ever being developed in the meningitis child. Perhaps the child impaired by meningitis lacked the cognitive and behavioral requirements to develop coordinated attention, whereas atypical twin B may have had more cognitive and motoric skills. Perhaps our cognitive and motor assessment instruments were not sufficiently accurate or sensitive to discriminate differences between these two severely handicapped infants.

However, the normal twin A did not show coordinated attention either. This points to the possibility of differences in styles of maternal interaction. It seems unlikely that nonhandicapped twin A is incapable of coordinating attention to objects and mother. So why did she not demonstrate coordinated attention? Perhaps the high degree of stress associated with "losing" a child to meningitis influenced mother A's interaction with her nonhandicapped child as well.

Our data suggest that coordinated attention may be demonstrated more frequently in the context of episodes that can be characterized as repetitive game-like sequences. Of the 28 incidences of coordinated attention seen in all four dyads, all but two occurred in sustained episodes. And all but one of the episodes that contained an instance of coordinated attention were repetitive game-like sequences.

Table 4 details the results supporting the relationship of game-like sequences and coordinated attention. We suggest nonhandicapped infant A may not have demonstrated coordinated attention because she and her mother established only three episodes, only one of which involved a repetitive game-like sequence. In contrast, the nonhandicapped infant who did show coordinated attention engaged in nine episodes, seven of which were repetitive.

If the repetitive pairing of mother's action and an attractive object is an important context in which infants learn to attend to mother and objects, then the lack of such repetitive game-like sequences may, in part, account for the absence of coordinated attention in the first handicapped infant. As seen in Table 4, mother A was not able to establish any repetitive sequences with her handicapped infant. In

contrast, the handicapped infant who did demonstrate coordinated attention was engaged in two such sequences.

The authors do not present these data as evidence supporting a causal relationship between repetitive sequences and the development of coordinated attention. However, we are proposing that this kind of sequence should be studied as an important context in which to investigate the demonstration and development of coordinated attention.

Conclusion

We found that the atypical infants in each twin set affected their mothers' interactions in similar ways. Both mothers followed their atypical child's lead less frequently; in each case the atypical twin provided few cues which mothers could follow and build into an interactive sequence. The resulting interaction was one in which the atypical infants spent relatively little time in joint attention with mother. Although the atypical twins were similar in their interactive patterns and the resulting play behaviors with their mothers closely resembled each other, there were differences between the twin pairs as well. One major difference between the way the mothers interacted with their children was that neither child in pair A showed coordinated attention even though one of the infants was nonhandicapped . Corresponding with this finding was the fact that mother A did not engage in game-like sequences. Future researchers may do well to investigate the relationship of these repetitive game-like sequences to the development and use of coordinated attention in infants.

Finally, it should be noted that this is a pilot study. These conclusions are posited as hypotheses which must be tested on a larger

sample before they can be accepted and generalized to other dyads. They do suggest, however, that we need to concentrate both on the similarities among handicapped infants and their effects on their parents and on the differences among individual parents in their responses to the infant.

References

Als, H. (1982). The unfolding of behavioral organization in the face of a biological violation. In E. Z. Tronick (Ed.), Social interchange in infancy: Affect, cognition, and communication. Baltimore: University Park Press.

Bates, E., Camaioni, L., & Volterra, V. (1979). The acquisition of performatives prior to speech. In E. Ochs & B. B. Schieffelin (Eds.), Developmental pragmatics. New York: Academic Press.

Bell, R. Q. (1974). Contributions of human infants to caregiving and social interaction. In M. Lewis & L. Rosenblum (Eds.), The effect of the infant on its caregiver. New York: John Wiley & Sons.

Bruner, J. S. (1982). The organization of action and the nature of the adult-infant transaction. In E. Z. Tronick (Ed.), Social interchange in infancy: Affect, cognition, and communication. Baltimore: University Park Press.

Chandler, L., Andrews, M., & Swanson, M. (1980). Movement assessment of infants. Seattle WA: University of Washington.

Clark, R. (1978). The transition from action to gesture. In J. Lock (Ed.), Action, gesture and symbol: The emergence of language. London: Academic Press.

Gray, H. (1978). Learning to take an object from the mother. In J. Lock (Ed.), Action, gesture and symbol: The emergence of language. London: Academic Press.

Harding, C. (1983). Setting the stage for language acquisition: Communication development in the first year. In R. M. Goglinkoff (Ed.), The transition from prelinguistic to linguistic communication. New Jersey: Erlbaum.

Jones, O. H. (1977). Mother-child communication with pre-linguistic Down's syndrome and normal infants. In H. R. Schaffer (Ed.), Studies in mother-infant interaction. London: Academic Press.

Nelson, K. (1979). The role of language in infant development. In M. H. Bornstein & W. Kessen (Eds.), Psychological development from infancy: Image to intention. New York: John Wiley & Sons.

Schaffer, H. R. (1977). Early interactive development. In H. R. Schaffer (Ed.), Studies in mother-infant interaction. London: Academic Press.

Trevarthen, C., & Hubley, P. (1978). Secondary intersubjectivity: Confidence, confiding and acts of meaning in the first year. In A. Lock (Ed.), Action, gesture and symbol: The emergence of language. London: Academic Press.

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Table 1

Infant Characteristics

	Motor "Risk Points" Movement Assessment of Infants	Cognitive Development Index (Bayley)	Chronological Age
Twin Pair A			
Atypical	55	< 28 (est.)	12 mos.
Normal	0	117	12 mos.
Twin Pair B			
Atypical	56	< 28 (est.)	12 mos.
Normal	0	107	12 mos.

Table 2

Mother Characteristics

	Education Level	Race	Income Level
Mother A	College	White	$20-25,000
Mother B	High School	Black	$10-15,000

Table 3

Similarities in Dyadic Interaction

	Mother Interruption	Percentage of Behaviors which Interrupt Joint Attention				Number of Times Mother Followed Child's Lead	Total Time in Episodes
		Infant Interruptions					
		Unfocused	Cry	Reflex	Obj. Dir.		
Twin Pair A							
Atypical	0	36%	18%	45%	0	1*	14 seconds
Normal	0	41%	6%	0	53% (9)	7	135 seconds
Twin Pair B							
Atypical	10%	10%	0	65%	15% (3)	2	84 seconds
Normal	29%	5%	0	0	67% (14)	6	202 seconds

*Based on mother's interpretation of baby attending to an object. Observer saw no object directed behavior on which to base maternal interpretation.

Table 4

Differences in Dyadic Interaction

	Number of Behaviors Directed to Mother	Number of Instances of Coordinated Attention	Number of Episodes	
			Repetitive	Non Repetitive
Twin Pair A				
Atypical	0	0	0	1
Normal	0	0	1	2
Twin Pair B				
Atypical	15	3	2	1
Normal	26	25	7	2